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Quantum energy calculations of technological parameters of electromagnetic impact on heavy hydrocarbons

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Abstract

© By the author(s). According to modern conceptualizations oil forms complex dispersed system containing disperse phase formed of high molecular compounds: long-straight-chained hydrocarbons or asphaltene-resin compounds with high concentration of heteroelements and metals and dispersion media formed of hydrocarbons of less molecular weight. These days, along with traditional methods for oil treating, the new ones are appearing aimed at transforming of high molecular compounds into smaller ones. And the role of magnetic, electromagnetic, acoustic field's investigations on the properties of the oil is growing. For the proper impact on oil it is necessary to conduct deep investigations of the oil components structure changes. In this regard, considerable interest, first of all, is quantum-chemical analysis of the relationship "carbon-carbon (C-C) and carbon - hydrogen (C-H), which is conducted not at the molecular but at the atomic level. So the purpose of the work was to conduct the quantum energy calculations of the parameters of electromagnetic impact on heavy hydrocarbons. With the changes in temperature of the system, the vibration frequency of atomic bonds will be also changed. Consequently, in any attempt to impact on petroleum components with using external excitation sources, should be taken into account the temperature factor and must be established connection between the source of impact and temperature. In this paper additional opportunities to specify the resonant excitation temperature of oil and the relationship between temperature and frequency characteristics of the atoms and molecules were identified.

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Keywords

Bitumen-polymer binder, Pulsed NMR, Roof waterproofing materials, Structural-group composition, Thermoplastic resins